ROBERT PARRINO • DAVID KIDWELL • THOMAS BATES

FUNDAMENTALS OF CORPORATE FINANCE

THIRD EDITION

WILEY

Selected Abbreviations and Notation

β =	beta (a measure of systematic risk)
Δ =	change (e.g., ΔP = change in price level, ΔS = change in sales level)
ρ =	correlation
σ^2 (σ) =	variance (standard deviation)
x =	fractional weight of investment or component of capital
Add WC =	addition to working capital
APR =	annual percentage rate
ARR =	accounting rate of return
b =	dividend payout ratio
C =	coupon payment (bond), call option value
Cap Exp =	capital expenditures
CF =	cash flow
CF Opns =	cash flow from operations
CFI =	cash flow to investors
CFLTA =	cash flow invested in long-term assets
CFNWC =	cash flow invested in net working capital
CFOA =	cash flow from operating activity
CIP =	call interest premium
CO =	crossover level of unit sales
COGS =	cost of goods sold
CV =	coefficient of variation
D =	dividend (stock)
D&A =	depreciation and amortization
DOL =	degree of operating leverage
DPO =	days' payables outstanding
DRP =	default risk premium
DSI =	days' sales in inventory
DSO =	days' sales outstanding
E(•) =	expected value (E(R) = expected return, etc.)
EAC =	equivalent annual cost
EAR = EAY =	effective annual rate (yield)
EBIT =	earnings before interest and taxes
EBITDA =	earnings before interest, taxes, depreciation, and amortization
EBT =	earnings before taxes
EFN =	external funding needed
EOQ =	economic order quantity
EROA =	EBIT return on assets
F =	face value (bond)
FC =	fixed costs
FCF =	free cash flows
FCFE =	free cash flow to equity
FCFF =	free cash flow from the firm

FV =	future value
FVA_n =	future value of an annuity
FXR =	foreign exchange or currency risk premium
g =	growth rate
i =	nominal rate of interest
IGR =	internal growth rate
IRR =	internal rate of return
k =	cost of capital (debt or equity)
m =	number of payments per year
MAT =	maturity adjustment to cost of a loan
MRP =	marketability risk premium
MV =	market value
n =	number of periods
NCF =	net cash flow
NCFOA =	net cash flow from operating activities
NOPAT =	net operating profits after tax
NPV =	net present value
NWC =	net working capital
OC =	operating cycle
Op Ex =	cash operating expenses
p =	probability
P =	price (P_0 = price at time zero, etc.), put option value
P/E ratio =	price/earnings ratio
PB =	payback period
PI =	profitability index
PR =	prime rate
PV =	present value
PV annuity factor =	present value of annuity factor
PVA_n =	present value of an annuity
PVP =	present value of a perpetuity
r =	real rate of interest
R =	return (R_{rf} = risk free, R_i, $R_{Portfolio}$, etc.)
ROA =	return on assets
ROE =	return on equity
S =	Sharpe Ratio
SGR =	sustainable growth rate
t =	tax rate
TV =	terminal value
V =	value (e.g.,$V_{Firm} = V_{Assets} = V_{Debt} + V_{Equity}$)
VC =	variable costs
WACC =	weighted average cost of capital

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FUNDAMENTALS OF CORPORATE FINANCE

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Dedication

ROBERT PARRINO

To my parents, whose life-long support and commitment to education inspired me to become an educator, and to my wife, Emily, for her unending support.

DAVID KIDWELL

To my parents, Dr. William and Margaret Kidwell, for their endless support of my endeavors; to my son, David Jr., of whom I am very proud; and to my wife, Jillinda, who is the joy of my life.

THOMAS BATES

To my wife, Emi, and our daughters, Abigail and Lillian. Your support, patience, fun, and friendship make me a better educator, scholar, and person.

ROBERT PARRINO

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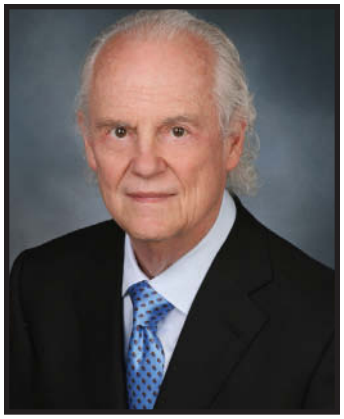
A member of the faculty at University of Texas since 1992, Dr. Parrino teaches courses in regular degree and executive education programs at the University of Texas, as well as in customized executive education courses for industrial, financial, and professional firms. He has also taught at the University of Chicago, University of Rochester, and IMADEC University in Vienna. Dr. Parrino has received numerous awards for teaching excellence at the University of Texas from students, faculty, and the Texas Exes (alumni association).

Dr. Parrino has been involved in advancing financial education outside of the classroom in a variety of ways. As a Chartered Financial Analyst (CFA) charterholder, he has been very active with the CFA Institute, having been a member of the candidate curriculum committee, served as a regular speaker at the annual Financial Analysts Seminar, spoken at over 20 Financial Analyst Society meetings, and served as a member of the planning committee for the CFA Institute's Annual Meeting. In addition, Dr. Parrino is the founding director of the Hicks, Muse, Tate & Furst Center for Private Equity Finance at the University of Texas. The center sponsors conferences and other educational activities in areas related to private equity finance. Dr. Parrino was Vice President for Financial Education of the Financial Management Association (FMA) from 2008 to 2010 and an academic director of the FMA from 2011 to 2013. Since 2009 he has served as a member of the Scientific Panel for the Center for Corporate Investor Responsibility in the Sim Kee Boon Institute of Financial Economics at Singapore Management University.

Dr. Parrino also co-founded the Financial Research Association and is Associate Editor of the *Journal of Corporate Finance*. Dr. Parrino's research focus includes corporate governance, financial policies, restructuring, mergers and acquisitions, and private equity markets. He has published his research in a number of journals, including the *Journal of Finance*, *Journal of Financial Economics*, *Journal of Financial and Quantitative Analysis*, *Journal of Law and Economics*, *Journal of Portfolio Management*, and *Financial Management*. Dr. Parrino has won a number of awards for his research, including the 2013–2014 Career Award for Outstanding Research Contributions at the McCombs School of Business.

Dr. Parrino has experience in the application of corporate finance concepts in a variety of business situations. Since entering the academic profession, he has been retained as an advisor on valuation issues concerning businesses with enterprise values ranging to more than $1 billion and has consulted in areas such as corporate financing, compensation, and corporate governance. Dr. Parrino was previously President of Sprigg Lane Financial, Inc., a financial consulting firm with offices in Charlottesville, Virginia, and New York City. While at Sprigg Lane, he was on the executive, banking, and portfolio committees of the holding company that owns Sprigg Lane. Before joining Sprigg Lane, Dr. Parrino was on the Corporate Business Planning and Development staff at Marriott Corporation. At Marriott, he conducted fundamental business analyses and preliminary financial valuations of new business development opportunities and potential acquisitions. Dr. Parrino holds a B.S. in chemical engineering from Lehigh University, an MBA degree from The College of William and Mary, and M.S. and Ph.D. degrees in applied economics and finance, respectively, from the University of Rochester.



DAVID S. KIDWELL

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Dr. Kidwell has over 30 years experience in financial education, as a teacher, researcher, and administrator. He has served as Dean of the Carlson School at the University of Minnesota and of the School of Business Administration at the University of Connecticut. Prior to joining the University of Connecticut, Dr. Kidwell held endowed chairs in banking and finance at Tulane University, the University of Tennessee, and Texas Tech University. He was also on the faculty at the Krannert Graduate School of Management, Purdue University where he was twice voted the outstanding undergraduate teacher of the year.

An expert on the U.S. financial system, Dr. Kidwell is the author of more than 80 articles dealing with the U.S. financial system and capital markets. He has published his research in the leading journals, including *Journal of Finance, Journal of Financial Economics, Journal of Financial and Quantitative Analysis, Financial Management,* and *Journal of Money, Credit, and Banking*. Dr. Kidwell has also participated in a number of research grants funded by the National Science Foundation to study the efficiency of U.S. capital markets, and to study the impact of government regulations upon the delivery of consumer financial services.

Dr. Kidwell has been a management consultant for Coopers & Lybrand and a sales engineer for Bethlehem Steel Corporation. He served on the Board of Directors for the Schwan Food Company and was the Chairman of the Audit and Risk Committee. Dr. Kidwell is the past Secretary-Treasurer of the Board of Directors of AACSB, the International Association for Management Education and is a past member of the Boards of the Minnesota Council for Quality, the Stonier Graduate School of Banking, and Minnesota Center for Corporate Responsibility. Dr. Kidwell has also served as an Examiner for the 1995 Malcolm Baldrige National Quality Award, on the Board of Directors of the Juran Center for Leadership in Quality, and on the Board of the Minnesota Life Insurance Company.

Dr. Kidwell holds an undergraduate degree in mechanical engineering from California State University at San Diego, an MBA with a concentration in finance from California State University at San Francisco, and a Ph.D. in finance from the University of Oregon.

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Dr. Bates is the Chair of the Department of Finance and Dean's Council of 100 Distinguished Scholar at the W. P. Carey School of Business, Arizona State University. He has also taught courses in finance at the University of Delaware, the Ivey School of Business at the University of Western Ontario, and the University of Arizona where he received the Scrivner teaching award. During his career as an educator, Professor Bates has taught corporate finance to students in undergraduate, MBA, executive MBA, and Ph.D. programs, as well as in custom corporate educational courses.

Professor Bates is a regular contributor to the academic finance literature in such journals as *The Journal of Finance*, *Journal of Financial Economics*, and *Financial Management*. His research addresses a variety of issues in corporate finance including the contracting environment in mergers and acquisitions, corporate liquidity decisions and cash holdings, and the governance of corporations. In practice, Dr. Bates has worked with companies and legal firms as an advisor on issues related to the valuation of companies and corporate governance. Dr. Bates received a B.A. in Economics from Guilford College and his doctorate in finance from the University of Pittsburgh.

Preface

We have written *Fundamentals of Corporate Finance* for use in an introductory course in corporate finance at the undergraduate level. It is also suitable for advanced undergraduate, executive development, and traditional or executive MBA courses when supplemented with cases and outside readings. The main chapters in the book assume that students are well-versed in algebra and that they have taken courses in principles of economics and financial accounting. Optional chapters covering important economic and financial accounting concepts are included for students and instructors seeking such coverage.

Balance Between Conceptual Understanding and Computational Skills

We wrote this corporate finance text for one very important reason. We want to provide students and instructors with a book that strikes the best possible balance between helping students develop an intuitive understanding of key financial concepts and providing them with problem-solving and decision-making skills. In our experience, teaching students at all levels and across a range of business schools, we have found that students who understand the intuition underlying the basic concepts of finance are better able to develop the critical judgment necessary to apply financial tools to a broad range of real-world situations. An introductory corporate finance course should provide students with a strong understanding of both the concepts and tools that will help them in their subsequent business studies and their personal and professional lives.

Market research supports our view. Many faculty members who teach the introductory corporate finance course to undergraduates want a book that bridges the gap between conceptually-focused and computationally-focused books. This text is designed to bridge this gap. Specifically, it develops the fundamental concepts underlying corporate finance in an intuitive manner while maintaining a strong emphasis on developing computational skills. This text also takes the students one step further by emphasizing the use of intuition and analytical skills in decision making.

Our ultimate goal has been to write a book and develop associated learning tools that help our colleagues succeed in the classroom—materials that are genuinely helpful in the learning process. Our book offers a level of rigor that is appropriate for finance majors and yet presents the content in a manner that both finance and non-finance students find accessible and want to read. Writing a book that is both *rigorous* and *accessible* has been one of our key objectives, and both faculty and student reviews of the first and second editions suggest that we have achieved this objective.

We have also tried to provide solutions to many of the challenges facing finance faculty in the current environment, who are asked to teach ever-increasing numbers of students with limited resources. Faculty members need a book and associated learning tools that help them effectively leverage their time. The organization of this book and the supplemental materials, along with the innovative *WileyPLUS* Web-based interface, which offers extensive problem solving opportunities and other resources for students, provide such leverage to an extent not found with other textbooks.

A Focus on Value Creation

This book is more than a collection of ideas, equations, and chapters. It has an important integrating theme—that of value creation. This theme, which is carried throughout the book, provides a framework that helps students understand the relations between the various concepts covered in the book and makes it easier for them to learn these concepts.

The concept of value creation is the most fundamental notion in corporate finance. It is in stockholders' best interests for value maximization to be at the heart of the financial decisions made within the firm. Thus, it is critical that students be able to analyze and make business decisions with a focus on value creation. The concept of value creation is introduced in the first chapter of the book and is further developed and applied throughout the remaining chapters.

The theme of value creation is operationalized through the net present value (NPV) concept. Once students grasp the fundamental idea that financial decision makers should only choose courses of action whose benefits exceed their costs, analysis and decision making using the NPV concept becomes second nature. By helping students better understand the economic rationale for a decision from the outset, rather than initially focusing on computational skills, our text keeps students focused on the true purpose of the calculations and the decision at hand.

Integrated Approach: Intuition, Analysis, and Decision Making

To support the focus on value creation, we have emphasized three things: (1) providing an intuitive framework for understanding fundamental finance concepts, (2) teaching students how to analyze and solve finance problems, and (3) helping students develop the ability to use the results from their analyses to make good financial decisions.

1. **An Intuitive Approach:** We believe that explaining finance concepts in an intuitive context helps students develop a richer understanding of those concepts and gain better insights into how finance problems can be approached. It is our experience that students who have a strong conceptual understanding of financial theory better understand how things really work and are better problem solvers and decision makers than students who focus primarily on computational skills.
2. **Analysis and Problem Solving:** With a strong understanding of the basic principles of finance, students are equipped to tackle a wide range of financial problems. In addition to the many numerical examples that are solved in the text of each chapter, this book has almost 1,200 end-of-chapter homework and review problems that have been written with Bloom's Taxonomy in mind. Solutions for these problems are provided in the Instructor's Manual. We strive to help students acquire the ability to analyze and solve finance problems.
3. **Decision Making:** In the end, we want to prepare students to make sound financial decisions. To help students develop these skills, throughout the text we illustrate how the results from financial analyses are used in decision making.

Organization and Coverage

In order to help students develop the skills necessary to tackle investment and financing decisions, we have arranged the book's 21 chapters into five major building blocks, that collectively comprise the seven parts of the book, as illustrated in the accompanying exhibit and described below.

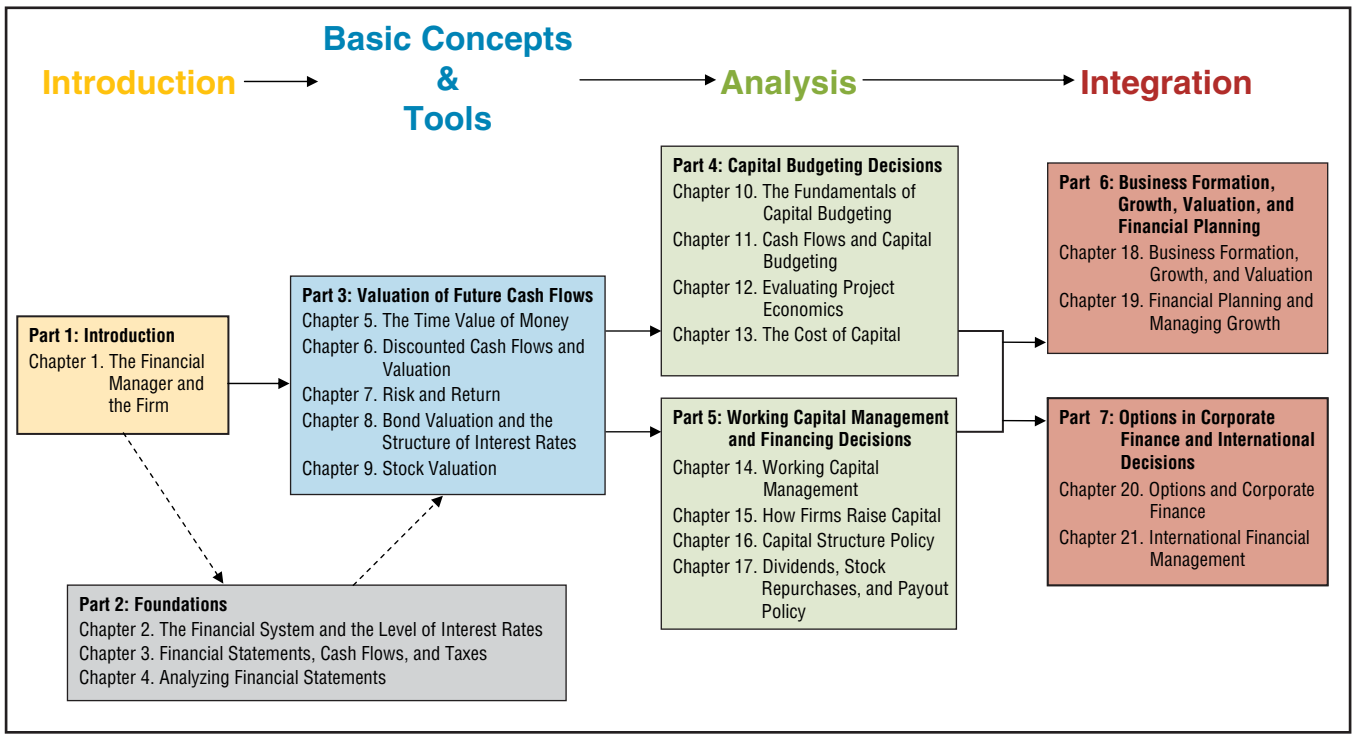
Introduction

Part 1, which consists of Chapter 1, provides an introduction to corporate finance. It describes the role of the financial manager, the types of fundamental decisions that financial mangers make, alternative forms of business organization, the goal of the firm, agency conflicts and how they arise, and the importance of ethics in financial decision-making. These discussions set the stage and provide a framework that students can use to think about key concepts as the course progresses.

Foundations

Part 2 of the text consists of Chapters 2 through 4. These chapters present the basic institutional, economic, and accounting knowledge and tools that students should understand before they begin the study of financial concepts. Most of the material in these chapters is typically taught in other courses. Since students come to the corporate finance course with varying academic backgrounds, and because the time that has elapsed since students have taken particular prerequisite courses also varies, the chapters in Part 2 can help the instructor ensure that all students have the same base level of knowledge early in the course. Depending on the educational background of the students, the instructor might not find it necessary to cover all or any of the material in these chapters. Some or all of these chapters might, instead, be assigned as supplemental readings.

Chapter 2 describes the services financial institutions provide to businesses, how domestic and international financial markets work, the concept of market efficiency, how firms use financial markets, and how interest rates are determined in the economy. Chapter 3 describes the key financial statements and how they are related, as well as how these statements are related to cash flows to investors. Chapter 4 discusses ratio analysis



and other tools used to evaluate financial statements. Throughout Part 2, we emphasize the importance of cash flows to get students thinking about cash flows as a critical component of all valuation calculations and financial decisions.

Basic Concepts and Tools

Part 3 presents basic financial concepts and tools and illustrates their application. This part of the text, which consists of Chapters 5 through 9, introduces time value of money and risk and return concepts and then applies these concepts to bond and stock valuation. These chapters provide students with basic financial intuitions and computational tools that will serve as the building blocks for analyzing investment and financing decisions in subsequent chapters.

Analysis

Parts 4 and 5 of the text focus on investment and financing decisions. Part 4 covers capital budgeting. Chapter 10 introduces the concept of net present value and illustrates its application as the principle tool for evaluating capital projects. It also discusses alternative capital budgeting decision rules, such as internal rate of return, payback period, and accounting rate of return, and compares them with the net present value criterion. Finally, Chapter 10 also discusses investment decisions with capital rationing. The discussions in Chapter 10 provide a framework that will help students in the rest of Part 4 as they learn the nuances of capital budgeting analysis in realistic settings.

Chapters 11 and 12 follow with in-depth discussions of how cash flows are calculated and forecast. The cash flow calculations are presented in Chapter 11 using a valuation framework that helps students think about valuation concepts in an intuitive way and that prepares them for the extension of these concepts to business valuation in Chapter 18. Chapter 12 covers analytical tools—such as breakeven, sensitivity, scenario, and simulation analysis—that give students a better appreciation for how they can deal with the uncertainties associated with cash flow forecasts.

Chapter 13 explains how the discount rates used in capital budgeting are estimated. This chapter uses an innovative concept—that of the finance balance sheet—to help students develop an intuitive understanding of the relations between the costs of the individual components of capital and the firm's overall weighted average cost of capital. It also provides a detailed discussion of methods used to estimate the costs of the individual components of capital that are used to finance a firm's investments and how these estimates are used in capital budgeting.

Part 5 covers working capital management and financing decisions. It begins, in Chapter 14, with an introduction to how firms manage their working capital and the implications of working capital management decisions for financing decisions and firm value. This is followed, in Chapters 15 and 16, with discussions of how firms raise capital to fund their real activities and the factors that affect how firms choose among the various sources of capital available to them. Chapter 16 also includes an extensive appendix on leasing concepts and buy vs. lease analysis. Chapter 17 rounds out the discussion of financing decisions with an introduction to dividends, stock repurchases, stock dividends and splits, and payout policy.

Integration

Part 6, which consists of Chapters 18 and 19, brings together many of the key concepts introduced in the earlier parts of the text. Chapter 18 covers financial aspects of business formation and growth and introduces students to business valuation concepts for both private and public firms. The discussions in this chapter integrate the investment and financing concepts discussed in Parts 4 and 5 to provide students with a more complete picture of how all the financial concepts fit together. Chapter 19 covers concepts related to financial planning, forecasting, and managing growth.

Part 7 introduces students to some important issues that managers must deal with in applying the concepts covered in the text to real-world problems. Chapter 20 introduces call and put options and discusses how they relate to investment and financing decisions. It describes options that are embedded in the securities that firms issue. It also explains, at an accessible level, the idea behind real options and why traditional NPV analysis does not take such options into account. In addition, the chapter discusses agency costs of debt and equity and the implications of these costs for investment and financing decisions. Finally, Chapter 20 illustrates the use of options in risk management. Instructors can cover the topics in Chapter 20 near the end of the course or insert them at the appropriate points in Parts 4 and 5. Chapter 21 examines how international considerations affect the application of concepts covered in the book.

Unique Chapters

Chapter on Business Formation, Growth, and Valuation

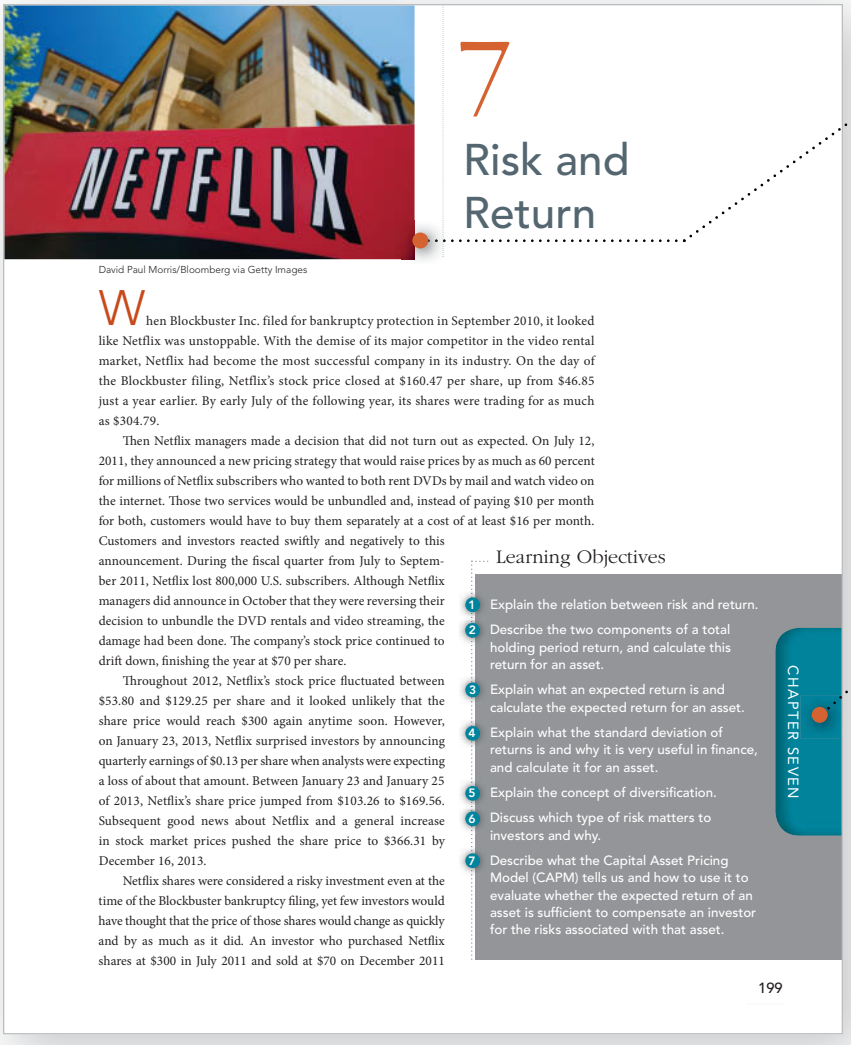
We wrote Chapter 18 in response to students' heightened interest in new business formation (entrepreneurship) and in order to draw together, in a comprehensive way, the key concepts from capital budgeting, working capital management, and financial policy. This capstone chapter provides an overview of practical finance issues associated with forecasting cash flows and capital requirements for a new business, preparing a business plan, and business valuation. The discussion of business valuation extends far beyond that found in other introductory corporate finance textbooks.

Chapter on Options and Corporate Finance

Many other corporate finance textbooks have a chapter that introduces students to financial options and how they are valued. This chapter goes further. It provides a focused discussion of the different types of financial and non-financial options that are of concern to financial managers, including options embedded in debt and equity securities, real options and their effect on project analysis, how option-like payoff functions faced by stockholders, bondholders, and managers affect agency relationships, and the use of options in risk management.

Proven Pedagogical Framework

We have developed several distinctive features throughout the book to aid student learning. The pedagogical features included in our text are as follows:

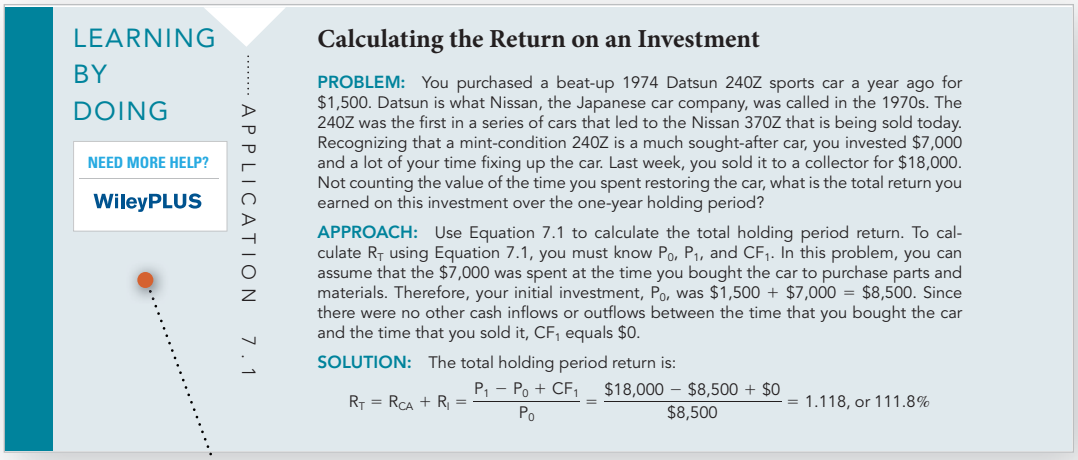


CHAPTER OPENER VIGNETTES

Each chapter begins with a vignette that describes a real company or personal application. The vignettes illustrate concepts that will be presented in the chapter and are meant to heighten student interest, motivate learning, and demonstrate the real-life relevance of the material in the chapter.

LEARNING OBJECTIVES

The opening vignette is accompanied by learning objectives that identify the most important material for students to understand while reading the chapter. At the end of the chapter, the Summary of Learning Objectives summarizes the chapter content in the context of the learning objectives.

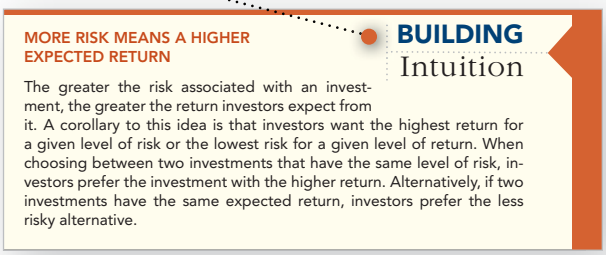


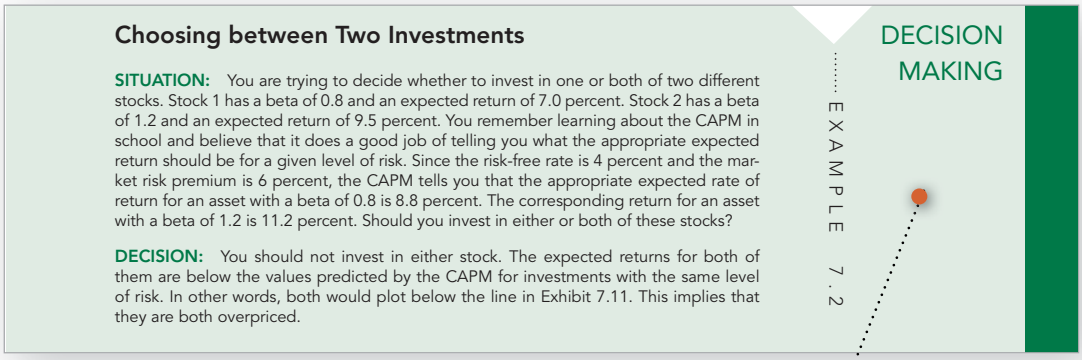
LEARNING BY DOING APPLICATIONS

Along with a generous number of in-text examples, most chapters include several Learning by Doing Applications. These applications contain quantitative problems with step-by-step solutions to help students better understand how to apply their intuition and analytical skills to solve important problems. By including these exercises, we provide students with additional practice in the application of the concepts, tools, and methods that are discussed in the text.

BUILDING INTUITION

Students must have an intuitive understanding of a number of important principles and concepts to successfully master the finance curriculum. Throughout the book, we emphasize these important concepts by presenting them in Building Intuition boxes. These boxes provide a statement of an important finance concept, such as the relation between risk and expected return, along with an intuitive example or explanation to help the student "get" the concept. These boxes help the students develop finance intuition. Collectively the Building Intuition boxes cover the most important concepts in corporate finance.





DECISION-MAKING EXAMPLES

Throughout the book, we emphasize the role of the financial manager as a decision maker. To that end, twenty chapters include Decision-Making Examples. These examples, which emphasize the decision-making process rather than computation, provide students with experience in financial decision making. Each Decision-Making Example outlines a scenario and asks the student to make a decision based on the information presented.

END OF CHAPTER PEDAGOGY

SUMMARY OF LEARNING OBJECTIVES AND KEY EQUATIONS

At the end of the chapter, you will find a summary of the key chapter content related to each of the learning objectives listed at the beginning of the chapter, as well as an exhibit listing the key equations in the chapter.

SUMMARY OF Learning Objectives

1 Explain the relation between risk and return.

Investors require higher returns for taking greater risk. They prefer the investment with the highest possible return for a given level of risk or the investment with the lowest risk for a given level of return.

2 Describe the two components of a total holding period return, and calculate this return for an asset.

The total holding period return on an investment consists of a capital appreciation component and an income component. This return is calculated using Equation 7.1. It is important to recognize that investors do not care whether they receive a dollar of return through capital appreciation or as a cash dividend. Investors value both sources of return equally.

3 Explain what an expected return is and calculate the expected return for an asset.

The expected return is a weighted average of the possible returns from an investment, where each of these returns is weighted by the

5 Explain the concept of diversification.

Diversification entails reducing risk by investing in two or more assets whose values do not always move in the same direction at the same time. Investing in a portfolio containing assets whose prices do not always move together reduces risk because some of the changes in the prices of individual assets offset each other. This can cause the overall variance in the returns of an investor's portfolio to be lower than if it consisted of only a single asset.

6 Discuss which type of risk matters to investors and why.

Investors care about only systematic risk. This is because they can eliminate unsystematic risk by holding a diversified portfolio. Diversified investors will bid up prices for assets to the point at which they are just being compensated for the systematic risks they must bear.

7 Describe what the Capital Asset Pricing Model (CAPM) tells us and how to use it to evaluate whether the expected return of an asset is sufficient to compensate an investor for the risks associated with that asset.

SUMMARY OF Key Equations

Equation	Description	Formula
7.1	Total holding period return	$R_T = R_{CA} + R_I = \frac{P_1 - P_0}{P_0} + \frac{CF_1}{P_0} = \frac{\Delta P + CF_1}{P_0}$
7.2	Expected return on an asset	$E(R_{Asset}) = \sum_{i=1}^{n} (p_i \times R_i)$
7.3	Variance of return on an asset	$Var(R) = \sigma_R^2 = \sum_{i=1}^{n} \{p_i \times [R_i - E(R)^2]\}$

SELF-STUDY PROBLEMS WITH SOLUTIONS

Five problems similar to the in-text Learning by Doing Applications follow the summary and provide additional examples with step-by-step solutions to help students further develop their problem-solving and computational skills.

Self-Study Problems

7.1 Kaaran made a friendly wager with a colleague that involves the result from flipping a coin. If heads comes up, Kaaran must pay her colleague $15; otherwise, her colleague will pay Kaaran $15. What is Kaaran's expected cash flow, and what is the variance of that cash flow if the coin has an equal probability of coming up heads or tails? Suppose Kaaran's colleague is willing to handicap the bet by paying her $20 if the coin toss results in tails. If everything else remains the same, what are Kaaran's expected cash flow and the variance of that cash flow?

7.2 You know that the price of CFI, Inc., stock will be $12 exactly one year from today. Today the price of the stock is $11. Describe what must happen to the price of CFI, Inc., today in order for an investor to generate a 20 percent return over the next year. Assume that CFI does not pay dividends.

7.3 The expected value of a normal distribution of prices for a stock is $50. If you are 90 percent sure that the price of the stock will be between $40 and $60, then what is the variance of the stock price?

7.4 You must choose between investing in Stock A or Stock B. You have already used CAPM to calculate the rate of return you should expect to receive for each stock given each one's systematic risk and decided that the expected return for both exceeds that predicted by CAPM by the same amount. In

Solutions to Self-Study Problems

7.1 Part 1: $E(\text{cash flow}) = (0.5 \times -\$15) + (0.5 \times \$15) = 0$

$\sigma^2_{\text{Cash flow}} = [0.5 \times (-\$15 - \$0)^2] + [0.5 \times (\$15 - \$0)^2] = 225$

Part 2: $E(\text{cash flow}) = (0.5 \times -\$15) + (0.5 \times \$20) = \$2.50$

$\sigma^2_{\text{Cash flow}} = [0.5 \times (-\$15 - \$2.50)^2] + [0.5 \times (\$20 - \$2.50)^2] = 306.25$

7.2 The expected return for CFI based on today's stock price is ($12 − $11)/$11 = 9.09 percent, which is lower than 20 percent. Since the stock price one year from today is fixed, the only way that you will generate a 20 percent return is if the price of the stock drops today. Consequently, the price of the stock today must drop to $10. It is found by solving the following: $0.2 = (\$12 - x)/x$, or $x = \$10$.

7.3 Since you know that 1.645 standard deviations around the expected return captures 90 percent of the distribution, you can set up either of the following equations:

$$\$40 = \$50 - 1.645\sigma \quad \text{or} \quad \$60 = \$50 + 1.645\sigma$$

and solve for σ. Doing this with either equation yields:

$$\sigma = \$6.079 \text{ and } \sigma^2 = 36.954$$

7.4 A comparison of the Sharpe Ratios for the two stocks will tell you which has the highest expected return per unit of total risk.

$$S_A = \frac{E(R_A) - R_{rf}}{\sigma_{R_A}} = \frac{0.10 - 0.05}{0.25} = 0.20$$

$$S_B = \frac{E(R_B) - R_{rf}}{\sigma_{R_B}} = \frac{0.15 - 0.05}{0.40} = 0.25$$

You should invest in Stock B because it has the highest expected return per unit of risk.

DISCUSSION QUESTIONS

At least ten qualitative questions, called Discussion Questions, require students to think through their understanding of key concepts and apply those concepts to a problem.

Discussion Questions

7.1 Suppose that you know the risk and the expected return for two stocks. Discuss the process you might utilize to determine which of the two stocks is a better buy. You may assume that the two stocks will be the only assets held in your portfolio.

7.2 What is the difference between the expected rate of return and the required rate of return? What does it mean if they are different for a particular asset at a particular point in time?

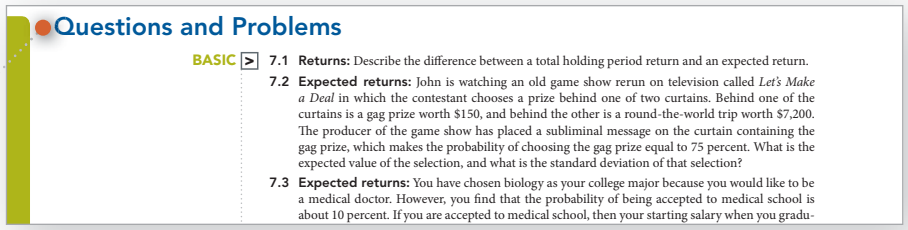
7.3 Suppose that the standard deviation of the returns on the shares of stock at two different companies is exactly the same. Does this mean that the required rate of return will be the same for these two stocks? How might the required rate of return on the stock of a third company be greater than the required rates of return on the stocks of the first two companies even if the standard deviation of the returns of the third company's stock is lower?

7.4 The correlation between stocks A and B is 0.50, while the correlation between stocks A and C is −0.5. You already own stock A and are thinking of buying either stock B or stock C. If you want your portfolio to have the lowest possible risk, would you buy stock B or C? Would you expect the stock you choose to affect the return that you earn on your portfolio?

7.5 The idea that we can know the return on a security for each possible outcome is overly simplistic. However, even though we cannot possibly predict all possible outcomes, this fact has little bearing on the risk-free return. Explain why.

QUESTIONS AND PROBLEMS

The Questions and Problems, numbering 26 to 48 per chapter, are primarily quantitative and are classified as Basic, Intermediate, or Advanced.

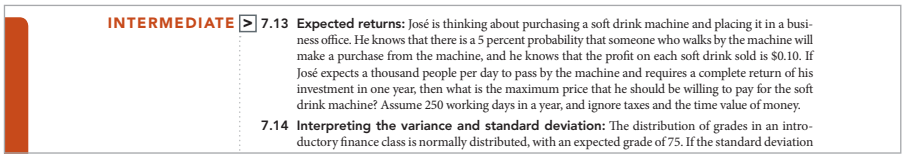


Questions and Problems

BASIC > **7.1 Returns:** Describe the difference between a total holding period return and an expected return.

7.2 Expected returns: John is watching an old game show rerun on television called *Let's Make a Deal* in which the contestant chooses a prize behind one of two curtains. Behind one of the curtains is a gag prize worth $150, and behind the other is a round-the-world trip worth $7,200. The producer of the game show has placed a subliminal message on the curtain containing the gag prize, which makes the probability of choosing the gag prize equal to 75 percent. What is the expected value of the selection, and what is the standard deviation of that selection?

7.3 Expected returns: You have chosen biology as your college major because you would like to be a medical doctor. However, you find that the probability of being accepted to medical school is about 10 percent. If you are accepted to medical school, then your starting salary when you gradu-

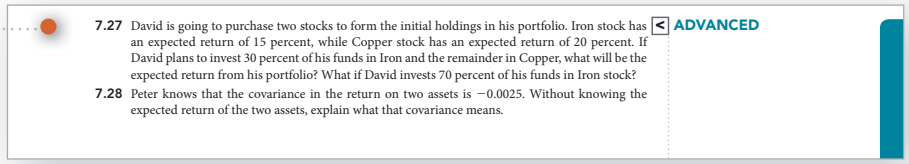


INTERMEDIATE > **7.13 Expected returns:** José is thinking about purchasing a soft drink machine and placing it in a business office. He knows that there is a 5 percent probability that someone who walks by the machine will make a purchase from the machine, and he knows that the profit on each soft drink sold is $0.10. If José expects a thousand people per day to pass by the machine and requires a complete return of his investment in one year, then what is the maximum price that he should be willing to pay for the soft drink machine? Assume 250 working days in a year, and ignore taxes and the time value of money.

7.14 Interpreting the variance and standard deviation: The distribution of grades in an introductory finance class is normally distributed, with an expected grade of 75. If the standard deviation

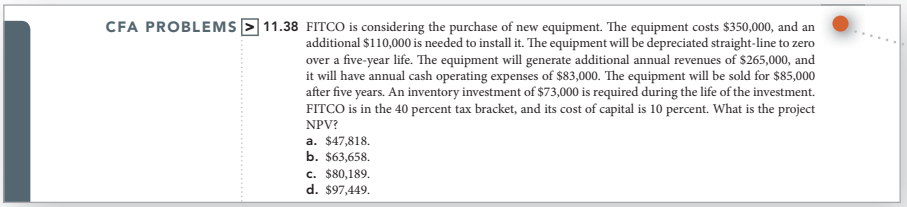
EXCEL PROBLEMS

Nearly all problems can be solved using Excel templates at the student Web site within *WileyPLUS*.



7.27 David is going to purchase two stocks to form the initial holdings in his portfolio. Iron stock has an expected return of 15 percent, while Copper stock has an expected return of 20 percent. If David plans to invest 30 percent of his funds in Iron and the remainder in Copper, what will be the expected return from his portfolio? What if David invests 70 percent of his funds in Iron stock? < ADVANCED

7.28 Peter knows that the covariance in the return on two assets is −0.0025. Without knowing the expected return of the two assets, explain what that covariance means.



CFA PROBLEMS > **11.38** FITCO is considering the purchase of new equipment. The equipment costs $350,000, and an additional $110,000 is needed to install it. The equipment will be depreciated straight-line to zero over a five-year life. The equipment will generate additional annual revenues of $265,000, and it will have annual cash operating expenses of $83,000. The equipment will be sold for $85,000 after five years. An inventory investment of $73,000 is required during the life of the investment. FITCO is in the 40 percent tax bracket, and its cost of capital is 10 percent. What is the project NPV?

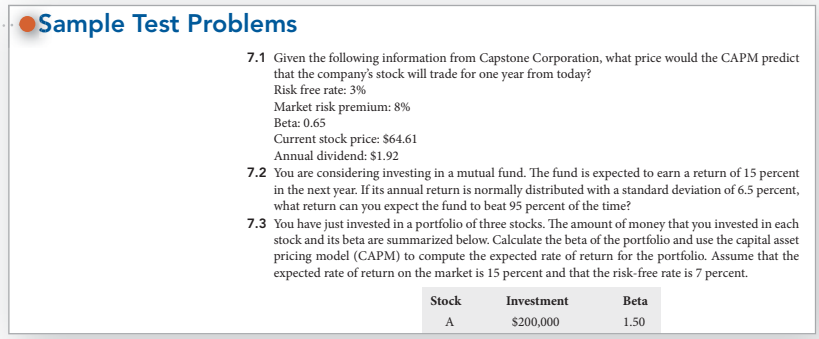
a. $47,818.
b. $63,658.
c. $80,189.
d. $97,449.

CFA PROBLEMS

Problems from CFA readings are included in the Question and Problem section in appropriate chapters.

SAMPLE TEST PROBLEMS

Finally, five or more Sample Test Problems call for straightforward applications of the chapter concepts. These problems are intended to be representative of the kind of problems that may be used in a test, and instructors can encourage students to solve them as if they were taking a quiz. Solutions are provided in the Instructor's Manual.



Sample Test Problems

7.1 Given the following information from Capstone Corporation, what price would the CAPM predict that the company's stock will trade for one year from today?
Risk free rate: 3%
Market risk premium: 8%
Beta: 0.65
Current stock price: $64.61
Annual dividend: $1.92

7.2 You are considering investing in a mutual fund. The fund is expected to earn a return of 15 percent in the next year. If its annual return is normally distributed with a standard deviation of 6.5 percent, what return can you expect the fund to beat 95 percent of the time?

7.3 You have just invested in a portfolio of three stocks. The amount of money that you invested in each stock and its beta are summarized below. Calculate the beta of the portfolio and use the capital asset pricing model (CAPM) to compute the expected rate of return for the portfolio. Assume that the expected rate of return on the market is 15 percent and that the risk-free rate is 7 percent.

Stock	Investment	Beta
A	$200,000	1.50

END OF PART ETHICS CASES

Ethics is an important topic in finance and this text addresses ethical issues in several ways. In Chapter 1, we introduce a framework for consideration of ethical issues in corporate finance. Many ethical issues can be analyzed in the context of informational asymmetry between parties to a transaction, conflicts of interest, breaches of confidentiality, and breaches of fiduciary duty (principal-agent relationships); we highlight examples of such analysis throughout the text. In addition, seven ethics cases are included throughout this book in order to help students better understand how to analyze ethical dilemmas in the context of the framework. Real company examples are presented, including timeless cases about Arthur Anderson and Martha Stewart's scandal involving ImClone, and more timely topics such as the subprime mortgage crisis and the advent of sustainable living plans by corporations. Each case includes questions for follow-up discussion in class or as an assignment.

New to This Edition

In revising Fundamentals of Corporate Finance we have improved the presentation and organization of key topics, added important new content, updated the text to reflect changes in market and business conditions since the second edition was written, improved key in-chapter pedagogical features, and added to the number and quality of the end-of-chapter problem sets.

Improved Content, Presentation, and Organization

In preparing this edition of *Fundamentals of Corporate Finance*, we have extensively edited discussions throughout the text, rearranged the order of material, and added new content to improve the depth and effectiveness of the presentation. For example, we have moved the discussion of capital rationing from Chapter 12 to Chapter 10. This change improves the flow of the text by presenting capital rationing concepts along with other general capital budgeting concepts, rather than in a chapter that otherwise focuses only on evaluating the economics of individual projects. In addition, we have incorporated a more complete discussion of forms of business organization into Chapter 1. This more complete discussion was previously only found in Chapter 18, a chapter that not all instructors have time to cover in an introductory course. The change makes it easier for instructors to expose students to the increasingly varied forms of business organization that we are seeing in practice. We have also added a new section to Chapter 12 that introduces the concept of the economic break-even point. This new section helps students better understand how concepts that are presented earlier in the text can be used to assess the overall economic viability of a project.

Current Financial Market and Business Information

Throughout the text, all financial market and business information for which more current data are available have been updated. Not only have the exhibits been updated, but financial values such as interest rates, risk premia, and foreign currency exchange rates have been updated throughout the discussions in text, in-text examples, and end-of-chapter problems. In addition, all of the chapter opener vignettes have either been replaced or updated. Two of these examples are from 2012, 13 are from 2013, and six are from 2014. All of the chapter openers provide timely examples of how the material covered in the chapter is relevant to financial decision-making.

In-Chapter Features

The **Learning Objectives** at the beginning of each chapter have been revised to more fully reflect the important content in the associated sections of the chapters.

New **Building Intuition Boxes** have been added where appropriate and existing Building Intuition Boxes have been edited to ensure clarity.

All **Learning by Doing Applications** have been reviewed and, where appropriate, updated or replaced.

All **Decision-Making Examples** have been reviewed and updated where necessary.

The **Summary of Learning Objectives** and **Key Equations** at the end of each chapter have been updated to reflect changes in the chapter text and to improve the pedagogical value of these features.

Refined and Extended Problem Sets

We have carefully edited the end-of-chapter questions and problems throughout the book to ensure that the examples are current and clearly presented. New Self-Study Problems, Discussion Questions, and Questions and Problems have been added to ensure appropriate coverage of key concepts at all levels of difficulty. In addition, more than a hundred new Sample Test Problems have been incorporated into the book in order to make these problems as representative of the key content in the book as possible. The total number of end-of-chapter questions and problems, including self-study problems and self-test questions, for the entire text has increased to 1,196.

Instructor and Student Resources

Fundamentals of Corporate Finance, Third Edition, features a full line of teaching and learning resources that were developed under the close review of the authors. Driven by the same basic beliefs as the textbook, these supplements provide a consistent and well-integrated learning system. This hands-on package guides *instructors* through the process of active learning and provides them with the tools to create an interactive learning environment. With its emphasis on activities, exercises, and the Internet, the package encourages *students* to take an active role in the course and prepares them for decision making in a real-world context.

WileyPLUS *WileyPLUS* with ORION is a research-based, online environment for effective teaching and learning. *WileyPLUS* builds students' confidence because it takes the guesswork out of studying by providing students with a clear roadmap: what to do, how to do it, if they did it right. This interactive approach focuses on:

Design: Research-based design is based on proven instructional methods. Content is organized into small, more accessible amounts of information, helping students build better time management skills.

Engagement: Students can visually track their progress as they move through the material at a pace that is right for them. Engaging in individualized self-quizzes followed by immediate feedback helps to sustain their motivation to learn.

Outcomes: Self-assessment lets students know the exact outcome of their effort at any time. Advanced reporting allows instructors to easily spot trends in the usage and performance data of their class in order to make more informed decisions.

With *WileyPLUS*, students will always know:

- What to do: Features, such as the course calendar, help students stay on track and manage their time more effectively.
- How to do it: Instant feedback and personalized learning plans are available 24/7.
- If they're doing it right: Self-evaluation tools take the guesswork out of studying and help students focus on the right materials.

WileyPLUS for *Fundamentals of Corporate Finance, Third Edition* includes numerous valuable resources, among them:

- Animated Learning by Doing Applications
- Wiley Corporate Finance Video Collection
- Prerequisite Course Reviews
- Animated Tutorials
- Excel Templates and Spreadsheet Solutions
- Flashcards and Crossword Puzzles
- Problem Walkthrough Videos
- Narrated PowerPoint Review
- Student Study Guide
- Hot Topics Modules
- Learning Styles Survey

Book Companion Site—For Instructors.

An extensive support package, including print and technology tools, helps you maximize your teaching effectiveness. We offer useful supplements for instructors with varying levels of experience and different instructional circumstances.

On this Web site instructors will find electronic versions of the Solutions Manual, Test Bank, Instructor's Manual, Computerized Test Bank, and other valuable resources: www.wiley.com/college/Parrino.

Instructor's Manual. Included for each chapter are lecture outlines, a summary of learning objectives and key equations, and alternative approaches to the material. The ***Solutions Manual*** includes detailed solutions to the Before You Go On questions, Self-Study problems, Discussion Questions, and all of the Questions and Problems at the end of each chapter.

Test Bank. With over 2000 questions, the test bank allows instructors to tailor examinations according to study objectives and difficulty. Multiple-choice, true/false, and essay questions are included.

Computerized Test Bank. The computerized test bank allows instructors to create and print multiple versions of the

same test by scrambling the order of all questions found in the Word version of the test bank. The computerized test bank also allows users to customize exams by altering or adding new problems.

PowerPoint Presentations. The PowerPoint presentations contain a combination of key concepts, figures and tables, and problems and examples from the textbook as well as lecture notes and illustrations.

Book Companion Site — For Students.

The *Fundamentals of Corporate Finance* student Web site provides a wealth of support materials that will help students develop their conceptual understanding of class material and increase their ability to solve problems. On this Web site students will find Excel templates, study tools, web quizzing, and other resources: www.wiley.com/college/Parrino.

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Brief Contents

Contents

PART 3 VALUATION OF FUTURE CASH FLOWS AND RISK

PART 5 WORKING CAPITAL MANAGEMENT AND FINANCING DECISIONS

PART 7 OPTIONS IN CORPORATE FINANCE AND INTERNATIONAL DECISIONS

THIRD
EDITION

FUNDAMENTALS OF CORPORATE FINANCE

1 The Financial Manager and the Firm

On May 24, 2012, Apollo Global Management, LLC, announced the completion of a $7.15 billion purchase of El Paso Corporation's oil and gas exploration and production business. This business, which would become an independent company named EP Energy, had drilling rights on almost 3.3 million acres of land with oil and gas reserves at varying levels of development. EP Energy had been acquired by Apollo and several other investors through a leveraged buyout—a transaction in which the purchaser uses a lot of debt to help pay for the acquisition.

Why did the investors decide to purchase El Paso Corporation's exploration and production business, and how did the El Paso managers and the investment group arrive at the $7.15 billion price tag? Surely the investors did not plan to lose money. Apollo, a very successful investor in the energy sector, believed that EP Energy was an excellent investment even at a cost of $7.15 billion. Sam Oh, a partner at Apollo, stated, "We are delighted to partner with one of North America's leading exploration and production franchises led by a world-class team of managers." By taking advantage of the operational experience of the management team and by using a great deal of debt financing, EP Energy was expected to earn high returns for its investors.

Investors in leveraged buyouts like the EP Energy transaction use many of the concepts covered in this chapter and elsewhere in this book to create the most value possible. Managers of leveraged buyout firms like Apollo are paid in a way that provides them with strong incentives to focus on value creation. They create value by investing in companies only when the benefits exceed the cost, managing the assets of the companies they buy as efficiently as possible, and financing those companies with the least expensive combination of debt and equity. This chapter introduces you to the key financial aspects of these activities, and the remainder of the book fills in many of the details.

Learning Objectives

1. Identify the key financial decisions facing the financial manager of any business.
2. Identify common forms of business organization in the United States and their respective strengths and weaknesses.
3. Describe the typical organization of the financial function in a large corporation.
4. Explain why maximizing the value of the firm's stock is the appropriate goal for management.
5. Discuss how agency conflicts affect the goal of maximizing stockholder value.
6. Explain why ethics is an appropriate topic in the study of corporate finance.

CHAPTER ONE

CHAPTER PREVIEW

This book provides an introduction to corporate finance. In it we focus on the responsibilities of the financial manager, who oversees the accounting and treasury functions and sets the overall financial strategy for the firm. We pay special attention to the financial manager's role as a decision maker. To that end, we emphasize the mastery of fundamental financial concepts and tools which are used to make sound financial decisions that create value for stockholders. These financial concepts and tools apply not only to business organizations but also to other venues, such as government entities, not-for-profit organizations, and sometimes even our own personal finances.

We open this chapter by discussing the three major types of decisions that a financial manager makes. We then describe common forms of business organization. After next discussing the major responsibilities of the financial manager, we explain why maximizing the value of the firm's stock is an appropriate goal for a financial manager. We go on to describe the conflicts of interest that can arise between stockholders and managers and the mechanisms that help align the interests of these two groups. Finally, we discuss the importance of ethical conduct in business.

1.1 THE ROLE OF THE FINANCIAL MANAGER

1 LEARNING OBJECTIVE

The financial manager is responsible for making decisions that are in the best interests of the firm's owners, whether the firm is a start-up business with a single owner or a billion-dollar corporation owned by thousands of stockholders. The decisions made by the financial manager or owner should be one and the same. In most situations this means that the financial manager should make decisions that maximize the value of the owners' stock. This helps maximize the owners' **wealth**, which is the economic value of the assets the owner possesses. Our underlying assumption in this book is that most people who invest in businesses do so because they want to increase their wealth. In the following discussion, we describe the responsibilities of the financial manager in a new business in order to illustrate the types of decisions that such a manager makes.

wealth
the economic value of the assets someone possesses

Stakeholders

Before we discuss the new business, you may want to look at Exhibit 1.1, which shows the cash flows between a firm and its owners (in a corporation, the stockholders) and various stakeholders. A **stakeholder** is someone other than an owner who has a claim on the cash flows of the firm: *managers,* who want to be paid salaries and performance bonuses; *other employees,* who want to be paid wages; *suppliers,* who want to be paid for goods or services they provide; *creditors,* who want to be paid interest and principal; and the *government,* which wants the firm to pay taxes. Stakeholders may have interests that differ from those of the owners. When this is the case, they may exert pressure on management to make decisions that benefit them. We will return to these types of conflicts of interest later in the book. For now, though, we are primarily concerned with the overall flow of cash between the firm and its stockholders and stakeholders.

stakeholder
anyone other than an owner (stockholder) with a claim on the cash flows of a firm, including employees, suppliers, creditors, and the government

It's All About Cash Flows

To produce its products or services, a new firm needs to acquire a variety of assets. Most will be long-term assets, which are also known as **productive assets**. Productive assets can be tangible assets, such as equipment, machinery, or a manufacturing facility, or intangible assets, such as patents, trademarks, technical expertise, or other types of intellectual capital. Regardless of the type of asset, the firm tries to select assets that will generate the greatest cash flows for the firm's owners. The decision-making process through which the firm purchases productive assets is called *capital budgeting,* and it is one of the most important decision processes in a firm.

productive assets
the long-term tangible and intangible assets a firm uses to generate cash flows

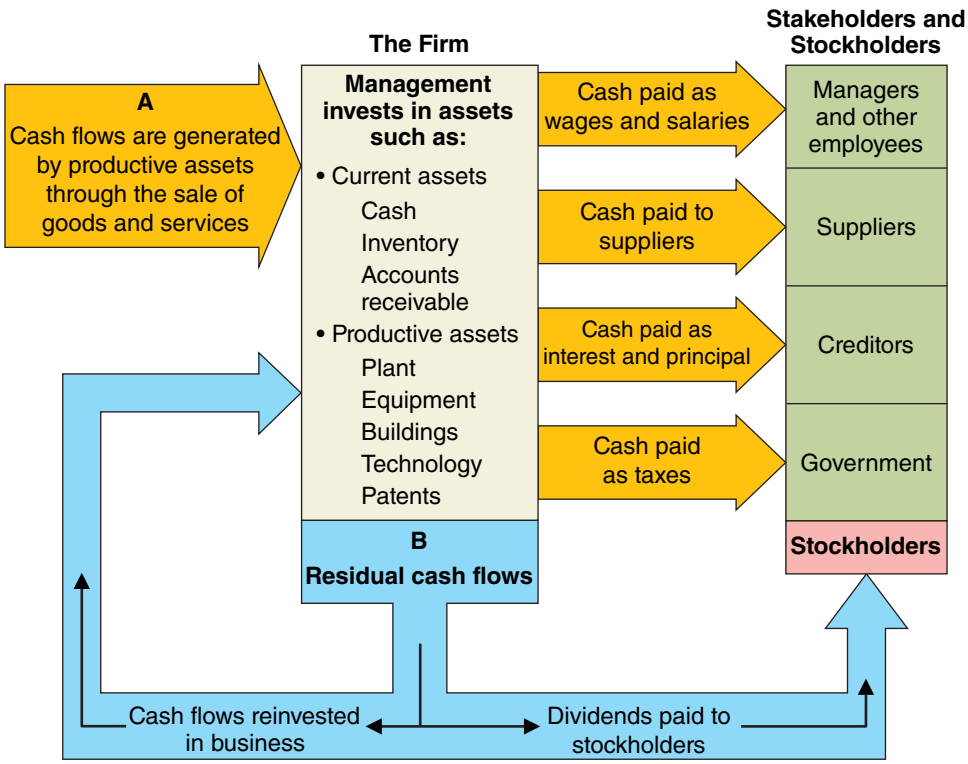

EXHIBIT 1.1
Cash Flows Between the Firm and Its Stakeholders and Owners (Stockholders)

A. Making business decisions is all about cash flows, because only cash can be used to pay bills and buy new assets. Cash initially flows into the firm as a result of the sale of goods or services. These cash inflows are used in a number of ways: to pay wages and salaries, to buy supplies, to repay creditors, and to pay taxes.
B. Any cash that is left over (residual cash flows) can be reinvested in the business or paid as dividends to stockholders.

Once the managers of a firm have selected the firm's productive assets, they must raise money to pay for them. *Financing decisions* determine the ways in which firms obtain and manage long-term financing to acquire and support their productive assets. There are two basic sources of funds: debt and equity. Every firm has some equity because equity represents ownership in the firm. It consists of capital contributions by the owners plus cash flows that have been reinvested in the firm. In addition, most firms borrow from a bank or issue some type of long-term debt to finance productive assets.

After the productive assets have been purchased and the business is operating, the managers of the firm will try to produce products at the lowest possible cost while maintaining quality. This means buying raw materials at the lowest possible cost, holding production and labor costs down, keeping management and administrative costs to a minimum, and seeing that shipping and delivery costs are competitive. In addition, day-to-day finances must be managed so that the firm will have sufficient cash on hand to pay salaries, purchase supplies, maintain inventories, pay taxes, and cover the myriad of other expenses necessary to run a business. The management of current assets, such as money owed by customers who purchase on credit, inventory, and current liabilities, such as money owed to suppliers, is called *working capital management.*[1]

A firm generates cash flows by selling the goods and services it produces. A firm is successful when these cash inflows exceed the cash outflows needed to pay operating expenses, creditors, and taxes. After meeting these obligations, managers of the firm can pay the remaining cash, called **residual cash flows**, to the owners as a cash dividend, or reinvest the cash in the business. The reinvestment of residual cash flows in the business to buy more productive assets is a very important concept. If these funds are invested wisely, they provide the foundation for the firm to grow and provide larger residual cash flows in the future for the owners. The reinvestment of cash flows (earnings) is the most fundamental way that businesses grow in size. Exhibit 1.1 illustrates how the revenue generated by productive assets ultimately becomes residual cash flows.

residual cash flows
the cash remaining after a firm has paid operating expenses and what it owes creditors and in taxes; can be paid to the owners as a cash dividend or reinvested in the business

[1]From accounting, *current assets* are assets that will be converted into cash within one year, and *current liabilities* are liabilities that must be paid within one year.

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CASH FLOWS MATTER MOST TO INVESTORS

Cash is what investors ultimately care about when making an investment. The value of any asset—a share of stock, a bond, or a business—is determined by the cash flows it is expected to generate in the future. To understand this concept, just consider how much you would pay for an asset from which you could never expect to obtain any cash flows. Buying such an asset would be like giving your money away. It would have a value of exactly zero. Conversely, as the expected cash flows from an investment increase, you would be willing to pay more and more for it.

A firm is unprofitable when it fails to generate sufficient cash inflows to pay operating expenses, creditors, and taxes. Firms that are unprofitable over time will be forced into **bankruptcy** by their creditors if the owners do not shut them down first. In bankruptcy the company will be reorganized or the company's assets will be liquidated, whichever is more valuable. If the company is liquidated, creditors are paid in a priority order according to the structure of the firm's financial contracts and prevailing bankruptcy law. If anything is left after all creditor and tax claims have been satisfied, which usually does not happen, the remaining cash, or residual value, is distributed to the owners.

bankruptcy
legally declared inability of an individual or a company to pay its creditors

Three Fundamental Decisions in Financial Management

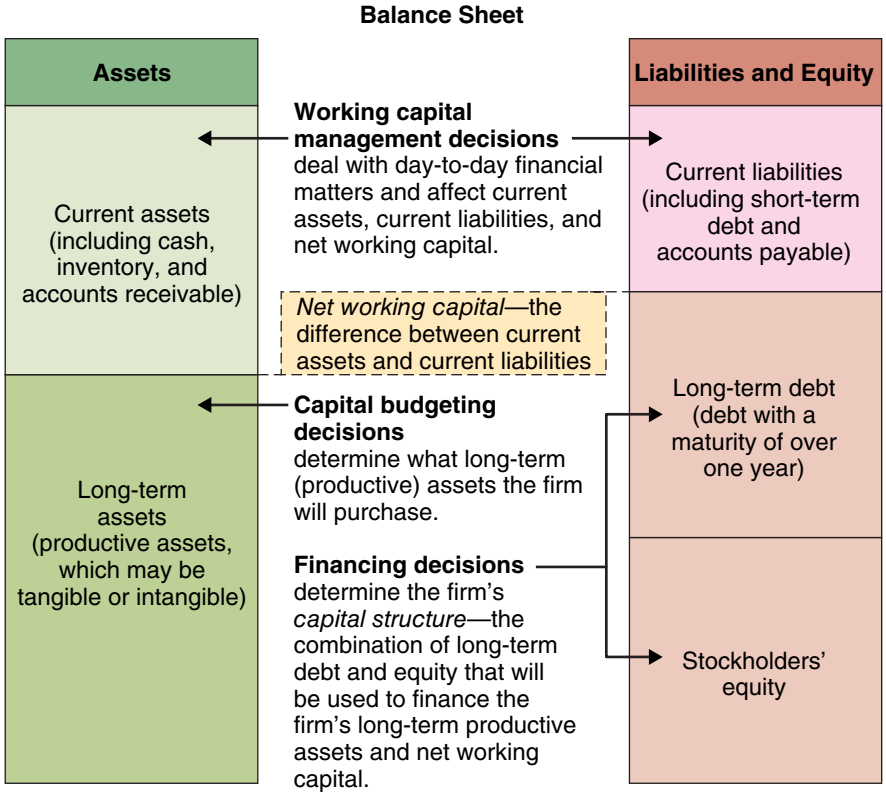
Based on our discussion so far, we can see that financial managers are concerned with three fundamental decisions when running a business:

1. *Capital budgeting decisions:* Identifying the productive assets the firm should buy.
2. *Financing decisions:* Determining how the firm should finance or pay for assets.
3. *Working capital management decisions:* Determining how day-to-day financial matters should be managed so that the firm can pay its bills, and how surplus cash should be invested.

Exhibit 1.2 shows the impact of each decision on the firm's balance sheet. We briefly introduce each decision here and discuss them in greater detail in later chapters.

EXHIBIT 1.2
How the Financial Manager's Decisions Affect the Balance Sheet

Financial managers are concerned with three fundamental types of decisions: capital budgeting decisions, financing decisions, and working capital management decisions. Each type of decision has a direct and important effect on the firm's balance sheet and, ultimately, the success or failure of the firm.



Capital Budgeting Decisions

A firm's capital budget is simply a list of the productive (capital) assets that management wants to purchase over a budget cycle, typically one year. The capital budgeting decision process addresses which productive assets the firm should purchase and how much money the firm can afford to spend. As shown in Exhibit 1.2, capital budgeting decisions affect the asset side of the balance sheet and are concerned with a firm's long-term investments. Capital budgeting decisions, as we mentioned earlier, are among management's most important decisions. Over the long run, they have a large impact on the firm's success or failure. The reason is twofold. First, capital (productive) assets generate most of the cash flows for the firm. Second, capital assets are long term in nature. Once they are purchased, the firm owns them for a long time, and they may be hard to sell without taking a financial loss.

The fundamental question in capital budgeting is this: Which productive assets should the firm purchase? A capital budgeting decision may be as simple as a movie theater's decision to buy a popcorn machine or as complicated as Boeing's decision to invest more than $6 billion to design and build the 787 *Dreamliner* passenger jet. Capital investments may also involve the purchase of an entire business, such as Google's purchase of the mobile software company Bump in May 2013.

Regardless of the project, a good capital investment is one in which the benefits are worth more to the firm than the cost of the asset. For example, in August 2012 Verizon Communications received government approval to purchase wireless spectrum (the right to use radio frequencies over which voice and data signals are sent) from a group of cable companies for $3.9 billion. Presumably, Verizon expects that the investment will produce a stream of cash flows worth more than that. Suppose Verizon estimates that in terms of the current market value, the future cash flows from the wireless spectrum purchase are worth $5 billion. Is the purchase a good deal for Verizon? The answer is yes because the value of the expected cash flow benefits from the purchase exceeds the cost by $1.1 billion ($5.0 billion − $3.9 billion = $1.1 billion). If the purchase of the wireless spectrum works out as planned, the value of Verizon will be increased by $1.1 billion!

Not all investment decisions are successful. Just open the business section of any newspaper on any day, and you will find stories of bad decisions. For example, Universal Picture's 2009 comedy *Land of the Lost* reportedly cost over $140 million in production and advertising expenses, but made only $69.5 million in worldwide box office receipts. Even with U.S. DVD sales of approximately $18 million, the overall cash flows from sales of the movie did not come close to covering its upfront costs. When, as in this case, the cost exceeds the value of the future cash flows, the project will decrease the value of the firm by that amount.

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SOUND INVESTMENTS ARE THOSE WHERE THE VALUE OF THE BENEFITS EXCEEDS THEIR COST

Financial managers should invest in a capital project only if the value of its future cash flows exceeds the cost of the project (benefits > cost). Such investments increase the value of the firm and thus increase stockholders' (owners') wealth. This rule holds whether you're making the decision to purchase new machinery, build a new plant, or buy an entire business.

Financing Decisions

Financing decisions determine how firms raise cash to pay for their investments, as shown in Exhibit 1.2. Productive assets, which are long term in nature, are financed by long-term borrowing, equity investment, or both. Financing decisions involve trade-offs between the advantages and disadvantages of these financing alternatives for the firm.

A major advantage of debt financing is that debt payments are tax deductible for many corporations. However, debt financing increases a firm's risk because it creates a contractual obligation to make periodic interest payments and, at maturity, to repay the amount that is borrowed. Contractual obligations must be paid regardless of the firm's operating cash flow, even if the firm suffers a financial loss. If the firm fails to make payments as promised, it defaults on its debt obligation and could be forced into bankruptcy.

In contrast, equity has no maturity, and there are no guaranteed payments to equity investors. In a corporation, the board of directors has the right to decide whether dividends should be paid to stockholders. This means that if a dividend payment is reduced or omitted altogether,

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FINANCING DECISIONS AFFECT THE VALUE OF THE FIRM

How a firm is financed with debt and equity affects the value of the firm. The reason is that the mix between debt and equity affects the taxes the firm pays and the probability that the firm will go bankrupt. The financial manager's goal is to determine the combination of debt and equity that minimizes the cost of financing the firm.

the firm will not be in default. Unlike interest payments, however, dividend payments to stockholders are not tax deductible.

The mix of debt and equity on the balance sheet is known as a firm's **capital structure**. The term capital structure is used because long-term funds are considered capital, and these funds are raised in **capital markets**—financial markets where equity and debt instruments with maturities greater than one year are traded.

capital structure
the mix of debt and equity that is used to finance a firm

capital markets
financial markets where equity and debt instruments with maturities greater than one year are traded

net working capital
the dollar difference between total current assets and total current liabilities

Working Capital Management Decisions

Management must also decide how to manage the firm's current assets, such as cash, inventory, and accounts receivable, as well as its current liabilities, such as trade credit and accounts payable. The dollar difference between a firm's total current assets and its total current liabilities is called its **net working capital**, as shown in Exhibit 1.2. As mentioned earlier, working capital management is the day-to-day management of the firm's short-term assets and liabilities. The goals of managing working capital are to ensure that the firm has enough cash to pay its bills and invest any spare cash to earn interest.

The mismanagement of working capital can cause a firm to default on its debt and go into bankruptcy, even though, over the long term, the firm may be profitable. For example, a firm that makes sales to customers on credit but is not diligent about collecting the accounts receivable can quickly find itself without enough cash to pay its bills. If this condition becomes chronic, creditors can force the firm into bankruptcy if the firm is not able to obtain alternative financing.

A firm's profitability can also be affected by its inventory level. If the firm has more inventory than it needs to meet customer demands, it has too much capital tied up in assets that are not earning cash. Conversely, if the firm holds too little inventory, it can lose sales because it does not have products to sell when customers want them. Management must therefore determine the optimal inventory level.

> BEFORE YOU GO ON

1. What are the three basic types of financial decisions managers must make?
2. Explain why you would make an investment if the value of the expected cash flows exceeds the cost of the project.
3. Why are capital budgeting decisions among the most important decisions in the life of a firm?

1.2 FORMS OF BUSINESS ORGANIZATION

2 LEARNING OBJECTIVE

Firms are organized in a number of different ways in the United States. In this section we discuss some of the more common forms of organization and the factors that business owners consider when they choose which to use. Exhibit 1.3 summarizes key characteristics of common forms of business organization.

Sole Proprietorships

sole proprietorship
a business owned by a single person

A **sole proprietorship** is a business that is owned by a single person. Its life is limited to the period that the owner (proprietor) is associated with the business because there is no ownership interest that can be transferred to someone else—there is no stock or other such interest that can

EXHIBIT 1.3 Characteristics of Different Forms of Business Organization

Choosing the appropriate form of business organization is an important step in starting a business. This exhibit compares key characteristics of the most popular forms of business organization in the United States.

	Sole Proprietorship	Partnership		Corporation		Limited Liability Partnership (LLP) or Company (LLC)
		General	Limited	S-Corp.	C-Corp.	
Cost to establish	Inexpensive	More costly	More costly	More costly	More costly	More costly
Life of entity	Limited	Flexible	Flexible	Indefinite	Indefinite	Flexible
Control by founder over business decisions	Complete	Shared	Shared	Depends on ownership	Depends on ownership	Shared
Access to capital	Very limited	Limited	Less limited	Less limited	Excellent	Less limited
Cost to transfer ownership	High	High	High	High	Can be low	High
Separation of management and investment	No	No	Yes	Yes	Yes	Yes
Potential owner/manager conflicts	No	No	Some	Potentially high	Potentially high	Some
Ability to provide incentives to attract and retain high-quality employees	Limited	Good	Good	Good	Good	Good
Liability of owners	Unlimited	Unlimited	Unlimited for general partner	Limited	Limited	Limited
Tax treatment of income	Flow-through	Flow-through	Flow-through	Flow-through	Double tax	As elected
Tax deductibility of owner benefits	Limited	Limited	Limited	Limited	Less limited	Limited

be sold. A sole proprietorship ceases to exist when the proprietor stops being involved with the business. Many small businesses in the United States are organized this way.

A sole proprietorship is the simplest and least expensive form of business to set up and is the least regulated. To start a sole proprietorship, all you have to do is obtain the business licenses required by your local and state governments.

The ownership structure of a sole proprietorship has both advantages and disadvantages. Among the advantages is the fact that the proprietor does not have to share decision-making authority with anyone and can run the business as he or she chooses.

There are several disadvantages related to the fact that there is no stock or other ownership interest to sell. First, the amount of equity capital that can be raised to finance the business is limited to the owner's personal wealth. This can restrict growth for the business unless the proprietor is very wealthy. Second, it can be more costly to transfer ownership. The proprietor must sell the assets of the business directly, rather than indirectly through the sale of an ownership interest in an operating business. The business must essentially be re-established every time it is sold. Third, because the proprietor provides all of the equity capital and manages the business, there is no separation of the management and investment roles. This limits the ability of good managers to form a business if they do not also have capital to invest. Fourth, it is not possible to provide employees with compensation in the form of ownership interests, such as stock or stock options, which can help motivate them to work harder.

Another disadvantage of a sole proprietorship is that proprietor faces *unlimited liability*. If someone is harmed by the business, the proprietor's liability extends beyond the money invested in the business. The proprietor can lose some or all of his or her personal wealth too.

Finally, profits from a sole proprietorship *flow through* to the sole proprietor's personal tax return, meaning that the business does not pay taxes before profits are distributed to the owner. Because the business is not subject to income taxes, profits are not subject to double-taxation as is a C-corporation (described later). There are limitations on tax deductions for personal expenses, such as those associated with health insurance, but the costs of these limitations are often outweighed by the benefits from the flow-through of profits in a sole proprietorship.

Partnerships

partnership
two or more owners who have joined together legally to manage a business and share its profits

A **partnership** consists of two or more owners who have joined together legally to manage a business. To form a partnership, the owners (partners) enter into an agreement that details how much capital each partner will invest in the partnership, what their management roles will be, how key management decisions will be made, how the profits will be divided, and how ownership will be transferred in case of specified events, such as the retirement or death of a partner. A *general partnership* is a partnership in which all of the partners are owners of (investors in) the business and active in managing it. In contrast, a *limited partnership* has both *general partners*, who are owners and managers, and *limited partners*, who are owners, but not managers.

Partnerships are more costly to form than sole proprietorships because the partners must hire an attorney to draw up and maintain the *partnership agreement*, which specifies the nature of the relationships between or among the partners. On the other hand, partnership agreements can be amended to allow for the business to continue when a partner leaves. The ability to make the life of a business independent of that of the partners increases the liquidity of the ownership interests, making it easier to raise capital and less costly for the partners to sell their interests at an attractive price.

Many of the other advantages and disadvantages of a general partnership are similar to those of a sole proprietorship. A key disadvantage of a *general partnership* is that, like the proprietor in a sole proprietorship, all partners have unlimited liability. This liability can be even worse than in a sole proprietorship because a general partner can be held liable for all of the partnership's debts and other obligations, regardless of what proportion of the business he or she owns or how the debt or other obligations were incurred.

The problem of unlimited liability is avoided for some partners in a *limited partnership* because limited partners can generally only lose the amount of money that they have invested in the business. In a limited partnership one or more general partners have unlimited liability and actively manage the business, while each limited partner is liable for business obligations only up to the amount of capital he or she invested in the partnership. In other words, the limited partners have **limited liability**. To qualify for limited partner status, a partner cannot be actively engaged in managing the business.

limited liability
the legal liability of an investor is limited to the amount of capital invested in the business

Corporations

corporation
a legal entity formed and authorized under a state charter; in a legal sense, a corporation is a "person" distinct from its owners

Most large businesses are organized as corporations. A **corporation** is a legal entity authorized under a state charter. In a legal sense, it is a "person" distinct from its owners. For example, corporations can sue and be sued, enter into contracts, borrow money, and own assets. They can also be general or limited partners in partnerships, and they can own stock in certain types of other corporations. Because a corporation is an entity that is distinct from its owners, it can have an indefinite life. Corporations hold the majority of all business assets and generate the majority of business revenues and profits in the United States. The owners of a corporation are its stockholders.

Starting a corporation is more costly than starting a sole proprietorship. For example, it requires writing articles of incorporation and by-laws that conform to the laws of the state of incorporation. These documents spell out the name of the corporation, its business purpose, its intended life span (unless explicitly stated otherwise, the life is indefinite), the amount of stock to be issued, and the number of directors and their responsibilities. Over the life of a successful business, these costs are not very important. However, to a cash-strapped entrepreneur, they can seem substantial.

On the other hand, the corporate form of organization has several advantages. For example, shares in a corporation can be sold to raise capital from investors who are not involved in the business. This can greatly increase the amount of capital that can be raised to fund the business.

Another major advantage of a corporation is that stockholders have limited liability for debts and other obligations. Owners of corporations have limited liability because corporations are *legal persons* that take actions in their own names, not in the names of individual owners.

An *S-corporation* is a form of corporation that can be used by private businesses that meet certain requirements. An S-corporation can have only one class of stock and cannot have more than one hundred stockholders or any stockholders that are corporations or nonresident alien investors. In contrast, a *C-corporation*, which is the form used by public corporations, does not face such limits.

While there are more restrictions on S-corporations, there are also advantages. Specifically, all profits earned by an S-corporation pass directly to the stockholders, just as they pass to a sole proprietor or the partners in a partnership. This means that no taxes are paid at the corporate level.

In contrast, a major disadvantage of a C-corporation is that it must pay taxes on the income it earns. If the corporation pays a cash dividend, the stockholders must also pay taxes on the dividends they receive. Thus, the owners of C-corporations are subject to double taxation—first at the corporate level and then at the personal level when they receive dividends.

Corporations can be classified as public or private. Most large companies prefer to operate as public corporations because large amounts of capital can be raised in public markets at a relatively low cost. **Public markets**, such as the New York Stock Exchange (NYSE) and NASDAQ, are regulated by the Securities and Exchange Commission (SEC).[2]

In contrast, **privately held,** or **closely held, corporations** are owned by a small number of investors, and their shares are not traded publicly. When a corporation is first formed, the common stock is often held by a few investors, typically the founder, a small number of key managers, and financial backers. Over time, as the company grows in size and needs larger amounts of capital, management may decide that the company should "go public" in order to gain access to the public markets. Not all privately held corporations go public, however.

Visit the Web sites of the NYSE and NASDAQ at http://www.nyse.com and http://www.nasdaq.com to get more information about market activity.

public markets
markets regulated by the Securities and Exchange Commission in which securities such as stocks and bonds are publicly traded

privately held, or closely held, corporations
corporations whose stock is not traded in the public markets

Limited Liability Partnerships and Companies

Historically, law firms, accounting firms, investment banks, and other professional groups were organized as sole proprietorships or partnerships. For partners in these firms, all income was taxed as personal income, and general partners had unlimited liability for all debts and other obligations of the firm. It was widely believed that in professional partnerships, such as those of attorneys, accountants, or physicians, the partners should be liable individually and collectively for the professional conduct of each partner. This structure gave the partners an incentive to monitor each other's professional conduct and discipline poorly performing partners, resulting in a higher quality of service and greater professional integrity. Financially, however, misconduct by one partner could result in disaster for the entire firm. For example, a physician found guilty of malpractice exposes every partner in the medical practice to financial liability, even if the others never treated the patient in question.

In the 1980s, because of sharp increases in the number of professional malpractice cases and large damages awards in the courts, professional groups began lobbying state legislators to create hybrid forms of business organization. One such hybrid is known as a **limited liability partnership (LLP)**. An LLP combines some of the limited liability characteristics of a corporation with the tax advantage of a partnership. While liability varies from state to state, LLP partners in general have more limited liability than general partners in regular partnerships. Typically, they are not personally liable for any other partner's malpractice or professional misconduct. Like regular partnerships, income to the partners of an LLP is taxed as personal income.

A **limited liability company (LLC)** is another hybrid form of organization that is becoming increasingly common. Like LLPs, LLCs have benefited founders of many businesses

limited liability partnership (LLP) and limited liability company (LLC)
hybrid business organizations that combine some of the advantages of corporations and partnerships; in general, income to the partners is taxed only as personal income, but the partners have limited liability

[2]We examine the public and private markets in more detail in Chapters 2 and 15.